

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) An air-cooled turbine blade, the blade having an airfoil shape defined by a convex suction side wall, a concave pressure side wall, a leading edge, a trailing edge, a root and a tip, the walls, edges, root and tip forming an interior for receiving blade cooling circuits; the turbine blade comprising:

a plurality of independent cooling circuits within said interior, at least one of said cooling circuits being positioned to cool said pressure side wall and at least one other of said cooling circuits being positioned to cool said suction side wall; and

- 10 wherein said pressure side wall cooling circuit comprises a serpentine passage having a plurality of pin fins and a turning vane.

2. (original) The turbine blade recited in Claim 1 wherein said plurality of cooling circuits comprises respective individual air inlets.

3. (original) The turbine blade recited in Claim 1 wherein said plurality of cooling circuits are mechanically interconnected to one another.

4. (currently amended) The turbine blade recited in Claim 1 wherein said plurality of cooling circuits comprises at least two of said cooling circuits positioned to cool said suction side wall, one closer to the leading edge and one closer to the trailing edge.

5. (currently amended) The turbine blade recited in Claim 1 wherein said plurality of cooling circuits comprises ~~at least one~~ a cooling circuit positioned substantially in the center of said interior.

6. (currently amended) The turbine blade recited in Claim 5 wherein said ~~at least one~~ cooling circuit positioned substantially at the center of said interior comprises walls having a greater thickness than the walls of said pressure side and suction side cooling circuits.

7. (canceled)

8. (original) The turbine blade recited in Claim 4 wherein said suction side cooling circuit closer to the leading edge comprises a plenum positioned adjacent said tip for cooling said tip.

9. (original) The turbine blade recited in Claim 4 wherein said suction side wall cooling circuit closer to said trailing edge comprises a serpentine portion and a pin bank portion, said pin bank portion having a plurality of tear drop slots forming trailing edge air flow dividers for cooling said trailing edge.

10. (original): The turbine blade recited in Claim 9 wherein said pin bank comprises a plurality of pin fins, said tear drop slots having two said pin fins between adjacent slots.

11. (original): The turbine blade recited in Claim 9 wherein said pin bank portion comprises a trailing edge tip flag having tip strip turbulators positioned adjacent said blade tip.

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12. (currently amended): The turbine blade recited in ~~Claim 7~~
Claim 1 wherein said ~~at least one~~ pressure side wall cooling circuit comprises a
super charger channel bypassing said serpentine passage.

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13. (currently amended): An air-cooled turbine blade, the blade
having an airfoil shape defined by a convex suction side wall, a concave
pressure side wall, a leading edge, a trailing edge, a root and a tip, the walls,
edges, root and tip forming an interior for receiving blade cooling circuits; the
5 turbine blade comprising:

a plurality of independent cooling circuits within said interior, at
least one of said cooling circuits being positioned to cool said pressure side wall
and ~~at least one~~ other of said cooling circuits being positioned to cool said
suction side wall;

10 wherein said plurality of cooling circuits are mechanically
interconnected to one another; and

wherein ~~at least~~ two of said cooling circuits are positioned to cool
said suction side wall, one closer to the leading edge and one closer to the
trailing edge; and

15 wherein ~~at least~~ one of said plurality of cooling circuits is
positioned substantially in the center of said interior.

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14. (currently amended): The turbine blade recited in Claim 13
wherein said ~~at least one~~ cooling circuit positioned substantially at the center of
said interior comprises walls having a greater thickness than the walls of said
pressure side and suction side cooling circuits.

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15. (currently amended): The turbine blade recited in Claim 13
wherein said ~~at least one~~ pressure side wall cooling circuit comprises a
serpentine passage having a plurality of pin fins and ~~at least one~~ [[a]] turning
vane.
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16. (original): The turbine blade recited in Claim 13 wherein said suction side cooling circuit closer to the leading edge comprises a plenum positioned adjacent said tip for cooling said tip.

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17. (original): The turbine blade recited in Claim 13 wherein said suction side wall cooling circuit closer to said trailing edge comprises a serpentine portion and a pin bank portion, said pin bank portion having a plurality of tear drop slots forming trailing edge air flow dividers for cooling said trailing edge.

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18. (original): The turbine blade recited in Claim 17 wherein said pin bank comprises a plurality of pin fins, said tear drop slots having two said pin fins between adjacent slots.

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19. (original): The turbine blade recited in Claim 17 wherein said pin bank portion comprises a trailing edge tip flag having tip strip turbulators positioned adjacent said blade tip.

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20. (currently amended): The turbine blade recited in Claim 15 wherein said ~~at least one~~ pressure side wall cooling circuit comprises a super charger channel bypassing said serpentine passage.

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21. (currently amended): An air-cooled turbine blade, the blade having an airfoil shape defined by a convex suction side wall, a concave pressure side wall, a leading edge, a trailing edge, a root and a tip, the walls, edges, root and tip forming an interior for receiving blade cooling circuits; the turbine blade comprising:

a plurality of independent cooling circuits within said interior, at least one of said cooling circuits being positioned to cool said pressure side wall

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and ~~at least one~~ other of said cooling circuits being positioned to cool said suction side wall;

10 wherein said plurality of cooling circuits are mechanically interconnected to one another; and

 wherein ~~at least~~ two of said cooling circuits are positioned to cool said suction side wall, one closer to the leading edge and one closer to the trailing edge;

15 wherein ~~at least~~ one of said plurality of cooling circuits is positioned substantially in the center of said interior and has walls having a greater thickness than the walls of said pressure side and suction side cooling circuits;

 said ~~at least one~~ pressure side wall cooling circuit having a
v 20 serpentine passage, said passage having a plurality of pin fins and ^a~~at least one~~ _^ [[a]] turning vane;

 said suction side cooling circuit closer to the leading edge having a plenum positioned adjacent said tip for cooling said tip;

 said suction side wall cooling circuit closer to said trailing edge
25 having a serpentine portion and a pin bank portion, said pin bank portion having a plurality of tear drop slots forming trailing edge air flow dividers for cooling said trailing edge.

22. (original): The turbine blade recited in Claim ¹⁹21 wherein said pin bank comprises a plurality of pin fins, said tear drop slots having two said pin fins between adjacent slots.

23. (original): The turbine blade recited in Claim ¹⁹21 wherein said pin bank portion comprises a trailing edge tip flag having tip strip turbulators positioned adjacent said blade tip.

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24. (currently amended): The turbine blade recited in Claim 21 19
wherein said ~~at least one~~ pressure side wall cooling circuit comprises a super
charger channel bypassing said serpentine passage.

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25. (currently amended): A method for improving the cooling
effectiveness of an air-cooled turbine blade, the blade having an airfoil shape
defined by a convex suction side wall, a concave pressure side wall, a leading
edge, a trailing edge, a root and a tip, the walls, edges, root and tip forming an
5 interior for receiving blade cooling circuits; the method comprising the steps of:
providing a plurality of independent cooling circuits within said
interior; and
positioning one of said cooling units substantially in the center of
the interior;
10 providing said center-positioned cooling circuit with thicker walls
than the walls of the remaining cooling circuits; and
injecting cooling air into each said cooling circuit through
respective independent air inlets.

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26. (currently amended): The method recited in Claim 25 further 23
comprising the steps of:
positioning ~~at least~~ one of said cooling circuits adjacent said
suction side wall; and
5 positioning ~~at least~~ one of said cooling circuits adjacent said
pressure sidewall.

27. (canceled):

28. (canceled):

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²⁵29. (currently amended): The method recited in Claim ²⁴26 further comprising the step of:

forming said ~~at least one~~ pressure side adjacent cooling circuit with a serpentine passage having a plurality of pins and ^a~~at least one~~ ₁ ²⁴[[a]] turning vane.

²⁶30. (currently amended): The method recited in Claim ²³25 further comprising the steps of:

positioning ~~at least one~~ of said cooling circuits adjacent said leading edge; and

forming said leading edge adjacent said cooling circuit to have a plenum positioned for cooling said ~~tips~~ tip.

²⁷31. (currently amended): The method recited in Claim ²⁶30 further comprising the step of ~~reusing~~ reusing cooling air after it cools said plenum.

²⁸32. (currently amended): The method recited in Claim ²⁴26 further comprising the step of forming said ~~at least one~~ suction side adjacent said cooling circuit to have an out of plane serpentine bend.

²⁹33. (currently amended): The method recited in claim ²⁵29 further comprising the step of optimizing the configuration of said plurality of pins to maximize heat transfer and optimizing the configuration of said ~~at least one~~ ~~tuning~~ turning vane to minimize flow separation.

³⁰34. (new): An air-cooled turbine blade, the blade having an airfoil shape defined by a convex suction side wall, a concave pressure side wall, a leading edge, a trailing edge, a root and a tip, with the walls, edges, root and tip forming an interior for receiving blade cooling circuits; the turbine blade comprising:

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a plurality of independent cooling circuits within said interior, a first of said cooling circuits being positioned to cool said pressure side wall, a second of said cooling circuits being positioned to cool said suction side wall, and a third of said cooling circuits positioned substantially in the center of said interior; and

wherein said cooling circuit positioned substantially at the center of said interior comprises walls having a greater thickness than the walls of said pressure side and suction side cooling circuits.

~~31~~ 35. (new): The turbine blade recited in Claim ~~34~~³⁰ wherein said plurality of cooling circuits comprises respective individual air inlets.

~~32~~ 36. (new): The turbine blade recited in Claim ~~34~~³⁰ wherein said plurality of cooling circuits are mechanically interconnected to one another.

~~33~~ 37. (new): The turbine blade recited in Claim ~~34~~³⁰ wherein said plurality of cooling circuits comprises two of said cooling circuits positioned to cool said suction side wall, one closer to the leading edge and one closer to the trailing edge.

~~34~~ 38. (new): The turbine blade recited in Claim ~~34~~³⁰ wherein said pressure side wall cooling circuit comprises a serpentine passage having a plurality of pin fins and one turning vane.

~~35~~ 39. (new): The turbine blade recited in Claim ~~37~~³³ wherein said suction side cooling circuit closer to the leading edge comprises a plenum positioned adjacent said tip for cooling said tip.

³⁶40. (new): The turbine blade recited in Claim ³³37 wherein said suction side wall cooling circuit closer to said trailing edge comprises a serpentine portion and a pin bank portion, said pin bank portion having a plurality of tear drop slots forming trailing edge air flow dividers for cooling said trailing edge.

³⁷41. (new): The turbine blade recited in Claim ³⁶40 wherein said pin bank comprises a plurality of pin fins, said tear drop slots having two said pin fins between adjacent slots.

³⁸42. (new): The turbine blade recited in Claim ³⁶40 wherein said pin bank portion comprises a trailing edge tip flag having tip strip turbulators positioned adjacent said blade tip.

³⁹43. (new): The turbine blade recited in Claim ³⁴38 wherein said pressure side wall cooling circuit comprises a super charger channel bypassing said serpentine passage.

⁴⁰44. (new): A method for improving the cooling effectiveness of an air-cooled turbine blade, the blade having an airfoil shape defined by a convex suction side wall, a concave pressure side wall, a leading edge, a trailing edge, a root and a tip, the walls, edges, root and tip forming an interior for receiving
5 blade cooling circuits; the method comprising the steps of:

providing a plurality of independent cooling circuits within said interior;

wherein one of said cooling circuits comprises a serpentine passage having a plurality of pins and a turning vane; and

10 injecting cooling air into each said cooling circuit through respective independent air inlets.

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41/45. (new): The method recited in Claim 44 further comprising the steps of:

positioning one of said cooling circuits adjacent said suction side wall; and

5 positioning one of said cooling circuits adjacent said pressure side wall.

42/46. (new): The method recited in Claim 44 further comprising the step of:

Positioning one of said cooling circuits substantially in the center of said interior.

43/47. (new): The method recited in Claim 46 further comprising the step of:

providing said center-positioned cooling circuit with thicker walls than the walls of the remaining cooling circuits.

44/48. (new): The method recited in Claim 45 further comprising the step of:

forming said pressure side adjacent cooling circuit with a serpentine passage having a plurality of pins and a turning vane.

45/49. (new): The method recited in Claim 44 further comprising the steps of:

positioning one of said cooling circuits adjacent said leading edge; and

5 forming said leading edge adjacent said cooling circuit to have a plenum positioned for cooling said tip.

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⁴⁶ 50. (new): The method recited in Claim ⁴⁵49 further comprising the step of reusing cooling air after it cools said plenum.

⁴⁷ 51. (new): The method recited in Claim ⁴¹45 further comprising the step of forming said suction side adjacent cooling circuit to have an out of plane serpentine bend.

